What STXM always promised and now delivers

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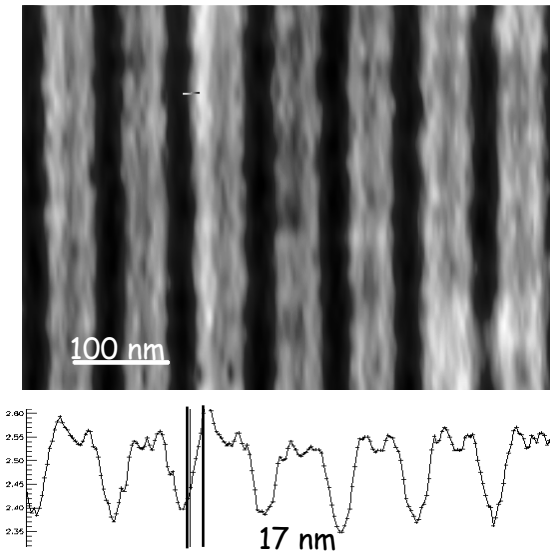
The Scanning Transmission X-ray Microscope (STXM) at the Advanced Light Source has been highly regarded for its potential since its inception. However, due to many different reasons, the STXM did not achieve its full potential early on at beamline 7.0.1 and was perceived as less useful than the full field x-ray microscope (XM1) on beamline 6.3.1.2. The Polymer STXM constructed on the bending magnet beamline 5.3.2 exceeded initial expectations but because of limits of a bending magnet as a source, this STXM has somewhat limited applications. Recently, the beamline 7.0.1 STXM was moved to the new ALS_MES EPU beamline 11.0.2 and has undergone several upgrades. The STXM branchline of ALS-MES beamline 11.0.2 was designed to deliver a beam matching STXM operational requirements. The combination of an optimized beamline and a new, excellent zone plate from CXRO show the STXM can deliver fully up to its potential.

Current ALS-MES 11.0.2 STXM parameters:

- Energy range: 150 eV to 2000 eV;
- Flux: up to 10^9 photons/s at 3000 resolving power;
- Beam spot size (theoretical) 30 nm;
- Experimental resolution has not been precisely characterized yet but it is very good.

The details of the current STXM performance will be discussed, highlighting a few examples of recent measurements on magnetic, environmental and biological samples.



Scanning transmission x-ray microscope image taken at 395 eV from a 25 nm test pattern (1:2 spacing).